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(71) Applicants
Morinaga & Co. Ltd.,
1-No. 33, 5-chome, Shiba,
Minato-ku, Tokyo, Japan
(72) Inventors
Eiji Itoh
Tadahiko Hirokawa
Hideo Nomura
Yasushi Kikuchi
(74) Agents
Walford & Hardman
Brown,
Trinity House,
Hales Street, Coventry,
CV1 1NP

(54) **Granular iced confection and method of producing same**

(57) A granular iced confection is described in which each grain comprises a granular food as the core and a coating layer of a frozen liquid. Examples of the granular food are beans, cut pieces of fruit, frozen liquid and compressed tablets. This iced confection is produced by adding a liquid to a sufficiently cooled granular food while grains of the granular food are rotated. The grain shape of the iced confection can be varied widely by controlling the cooling temperature, the rate of rotating the food grains and/or the manner of adding the liquid to the food grains.

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FIG.1

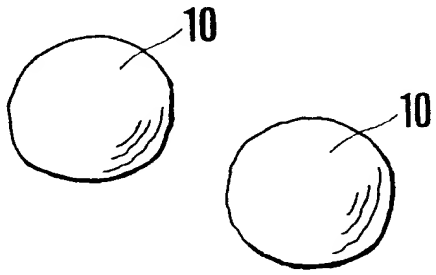


FIG.2

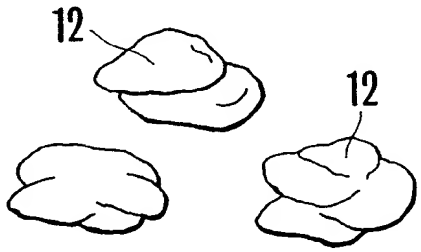


FIG.3

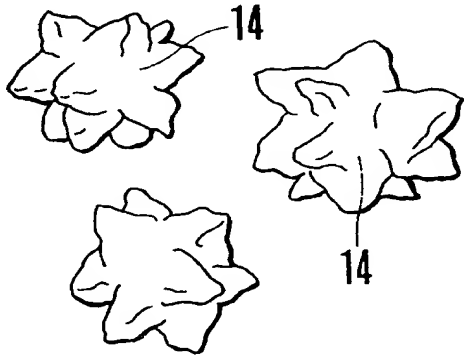


FIG.4

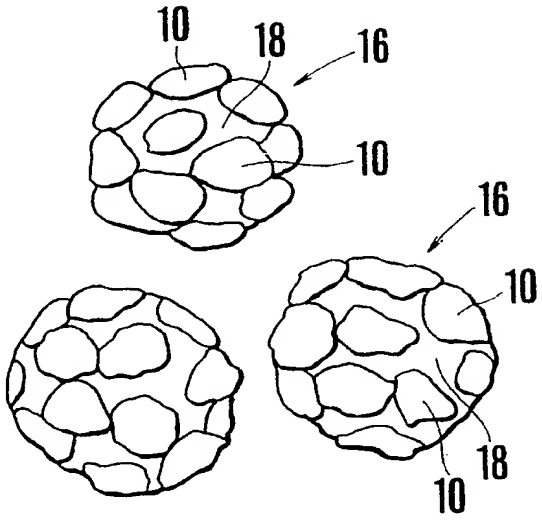
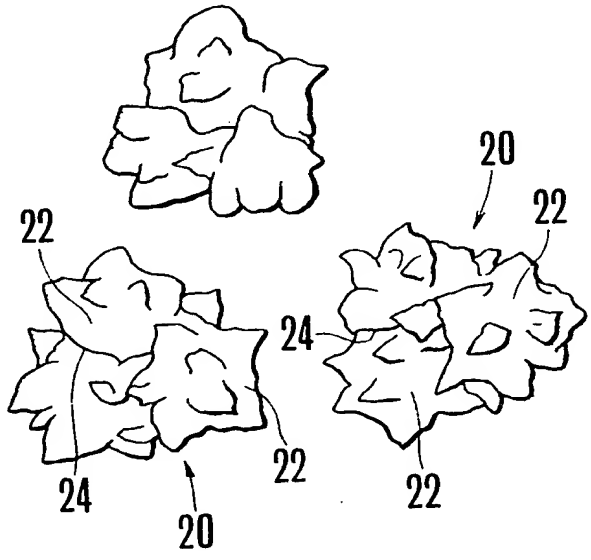


FIG.5



SPECIFICATION

Granular iced confection and method of producing same

This invention relates to a novel type of refreshing iced confection which is granular in a broad sense and each grain of which comprises a granular food as a core and a coating layer of a frozen liquid and a method of producing the same.

Until now, commercial frozen confections such as ice cream, ice milk, water-ice and the like have been packed in containers such as cups or moulded into a suitable shape with a stick inserted therein. In other words, these frozen confections have been sold as a relatively large mass which has to be divided into mouthful portions by using a spoon or by biting, and there is no known granular frozen confection that can be eaten at a mouthful.

It is an object of the present invention to provide a novel type of iced confection which is granular in a broad sense and can be eaten without first dividing it into portions by biting or by using a utensil.

It is another object of the invention to provide a granular iced confection of various shapes, sizes, appearances and flavours packaged attractively.

It is still another object of the invention to provide a method of producing a granular iced confection.

Each grain of a granular iced confection according to the present invention comprises a granular food which serves as a core and a layer of a frozen liquid frozen to the granular food so as to cover it entirely.

There is no strict limitation to the size of each grain of an iced confection according to the invention. A grain size of about 10-30 mm. is usual so that a grain or a few grains may be eaten at a mouthful without breaking, but if desired, it is possible to make a larger grain or lump of a size which is comparable to a table tennis ball or base-ball.

The shape of this iced confection is not limited to a globe or oval. Each grain may have an irregular shape and may have either a smoothly round or curved surface or an uneven, rugged or jagged surface. For example, each grain can be made to have a plurality of peaked projections so that in plan view the grain is of a star-like shape. Moreover, each grain of this iced confection may take the form of a cluster-like agglomerate of a plurality of grains, each comprising a granular food as a core and a frozen liquid coating layer, firmly frozen to one another.

A granular iced confection according to the invention may consist of grains of the same shape, size and colour. A mass of such uniform grains gives an aesthetic pleasure. Also it is possible to mix two or more kinds of differently designed granular iced confections according to the invention so that the resultant mixture comprises grains different in shape, size, colour and/or taste. In commercial practice, each package of such a mixture pleases the eye and/or allows the consumer to enjoy different kinds of tastes or feelings.

In the case of agglomerated grains as mentioned above, it is possible to agglomerate differently shaped, coloured and/or flavoured unit grains with the result that each of the agglomerates has a pleasant appearance and/or offers a compounded taste.

The granular food serving as the core of each grain can be selected from a wide variety of foods which can be eaten in a frozen state and inherently granular, as exemplified by boiled and seasoned beans, dividable into grains or cubes, as exemplified by fruits, or capable of being solidified into small pieces, as exemplified by water, jelly and powdery sweets.

The liquid as the material for the frozen coating layer is selected from a wide variety of edible liquids which can be frozen at a readily practicable temperature. Besides potable water, coloured and flavoured water and various juices and solutions, which are not always sweetened, can be used.

According to another aspect of the present invention, a granular iced confection is produced by a method comprising the steps of rotating and revolving individual grains of a granular food and simultaneously sufficiently cooling the granular food, adding a liquid to the rotating and revolving grains of the granular food when the grains are cooled below the freezing temperature of the liquid, and continuing to rotate and revolve the cooled grains of the granular food, thereby causing the added liquid to cover and freeze to each grain of the granular.

The rotation and revolution of the grains of a selected granular food can be effected, for example, in a vessel which is subjected to a rotational, eccentrically rotational and/or vibrational movement. The cooling of the rotating and revolving food grains and the addition of a liquid to the cooled food grains can be accomplished in various ways. To make the frozen liquid layer sufficiently thick, the steps of adding the liquid to the cooled food grains and continuing rotation and revolution of the food grains may be repeated several times. It is possible to form a multi-layered frozen liquid coating by alternately using two or more differently coloured and/or flavoured liquids.

The rate of rotation and revolution of food grains, the extent of the cooling and the manner of adding a liquid to the cooled food grains are all widely variable, and it is possible to vary the grain surface condition and/or grain shape of the product by appropriately determining these operation factors.

Several embodiments of iced confection in accordance with the invention are now described, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a perspective view of globular grains of an iced confection embodying the invention;

Figure 2 is a perspective view of an example of irregularly shaped grains of an iced confection according to the invention;

Figure 3 is a perspective view of grains having peaked protuberances as another example of irregularly shaped grains of an iced confection according to the invention;

Figure 4 is a perspective view of cluster-like grains of an iced confection according to the invention, each formed of a number of generally globular small grains adhered to one another with a frozen liquid, and

Figure 5 is a perspective view of cluster-like grains

of an iced confection, according to the invention, each formed of several smaller grains having a shape as shown in Figure 3 adhered to one another with a frozen liquid.

In accordance with the present invention, a wide variety of edibles that can be made to take the form of relatively small pieces such as grains, cubes, pellets or tablets and can be eaten in frozen state are ueful as the core material. Examples of such edibles are: (a) inherently granular edibles such as raisins, boiled or cooked beans, and boiled, sweetened and half-dehydrated red beans or other beans; (b) relatively large-sized edibles such as fruits and vegetables cut into small grains or cubes, which may have been cooked or candied; (c) ice and other frozen beverages broken into grains or cubes; (d) soft and resilient solid foods that can be cut into pieces and frozen such as jellies, jelly-like confections, including Japanese "yokan" or sweet jelly of beans, and marshmallow; and (e) hard and moulded foods such as candy drops, chocolate grains and compressed tablets. When ice or a frozen beverage is used as the core material, each grain of an iced confection, according to the invention, becomes substantially homogeneous. The shape and size of selected food grains can discretionally be determined according to the shape and size of the grains of an intended iced confection.

A liquid as the material for the outer ice layer may be water but usually is selected among a wide variety of liquid edibles having a certain flavour. Examples are syrups, fruit juices, coffee, liqueurs and other seasoned liquid edibles, typified by clear soup. In the case of using a seasoned liquid it is preferred to have a desired flavour by seasoning, for example, with sugar or a substitute sugar, salt, organic acid, synthetic seasoning, soy and/or broth. In general, it is desirable to use a liquid food that freezes at a temperature as high as possible, meaning that the depression of freezing point would be considered in selecting seasoning flavourings.

In the production of a granular iced confection according to the invention, grains of a selected food are rotated and revolved usually by using an apparatus having a vessel which is subjected to a rotational, eccentrically rotational and/or vibrational movement. For example, the vessel may be one that is rotated by a rotary shaft or rollers such as a revolving pan or rotary drum; a flat-bottomed vessel or a bilge-like vessel that undergoes an eccentic movement such as a gyrosifter or a flat type roasting oven; or a vessel that makes a vertically and/or horizontally vibrational movement. Furthermore, use may be made of a more complicated apparatus having, e.g., a vessel which is mounted in an inclined and revolving shaft and itself makes an oscillating movement so that the vessel makes a very complicated movement, like a merry-go-round, as a compound of rotational, eccentically rotational and oscillatory movements. Still differently, food grains may be kept in the state of a fluidized bed by confining them in a cylindrical vessel into which air or a gas is continuously blown from the bottom upwardly.

Cooling of the rotating and revolving food grains can be accomplished, e.g., by installing the rotary apparatus in a cooled space such as a refrigerating warehouse, introducing cooled air into the moving vessel, circulating a refrigerant along the outer side of the vessel or by allowing the vessel to make a direct contact with a refrigerant. In practice, the most convenient and advantageous cooling method will be to introduce a coolant or refrigerant such as dry ice, liquid nitrogen and/or liquid carbon dioxide into the vessel. The amount of time required for the cooling process can be reduced by using a sufficiently cooled or frozen food grains.

It is desirable to cool the rotating and revolving food grains to a temperature at least 5°C below the freezing temperature of the liquid to be added to the food grains. When, for example, use is made of a seasoned liquid resembling in composition a flavoured sugar solution for the production of a conventional water-ice, it is desirable to cool the food grains to a temperature of −15°C or below.

As a liquid is introduced into a vessel in which food grains are rotating and revolving in a sufficiently cooled state, the liquid spreads over the surfaces of the individual food grains and soon firmly freezes to the grain surfaces.

The grains shape of a granular iced confection produced by this method depends significantly on the manner of introducing the liquid into the vessel.

When the liquid is introduced into the vessel as a mist of very tiny liquid particles by spraying or by injection through a nozzle or fine openings, each food grain is entirely coated with an iced layer to become a grain of an iced confection. In this case the mechanism of the formation of the iced coating layer is probably as follows.

A portion of the tiny droplets or particles of the liquid introduced into the vessel arrives at the surfaces of the individual food grains and freezes to the food grains surfaces, while the remaining portion of the liquid particles freeze into tiny ice particles such as snowflakes in a cold atmosphere in the vicinity of the cooled food grains or on the surfaces of dry ice lumps, if used. Some of the thus formed ice particles stick to the food grain surfaces during freezing of the liquid particles on the surfaces. Since the food grains are rotating and revolving, further ice particles stick to and freeze to the iced surfaces of the food grains. Thus, an iced layer on the surface of each food grain gradually increases its thickness in a way resembling the growth of a snow-ball in the process of making a snowman. Therefore, it is possible to produce iced confection grains each having an iced coating layer of a desired thickness by repeating the introduction of the liquid particles into the vessel at short intervals, while continuing with the operation of the vessel.

Also, the condition of the outer surface of an iced coating layer formed in this way can be varied by varying the cooling temperature and/or the rate of rotation and revolution of the food grains.

When the cooling temperature is relatively high, a granular iced confection consisting of globular grains 10 as shown in Figure 1 is produced, and the iced coating layer of each grain 10 has a smoothly round outer surface. As the cooling temperature is made lower, without varying the other factors, the

outer surface of each grain of the resultant iced confection becomes gradually uneven or undulated. When the cooling temperature is very low, the iced coating layer becomes more deformed than simply undulated and has noticeable protuberances, so that the iced confection grains can no longer be expressed as globular. When the cooling temperature is extremely low and the food grains are rotating and revolving at a very high rate, meaning that the vessel is rotated vigorously, the iced layer of each grain 12 has relatively short and roundish protuberances such that each grain 12 has an irregular shape like a popcorn grain or a piece of "arare" (puffed rice confection) as illustrated in Figure 2, by way of example. When the rate of rotation and revolution is low, meaning that the vessel is rotated slowly, under a similarly low temperature condition, the iced layer is formed with a larger number of considerably extended and peaked protuberances, which may be expressed as horns or spikes rather than mere protuberances. Accordingly each grain 14 of the iced confection is very jagged, and similar in shape to a piece of confetti (known as "kompei-to" in Japanese) as illustrated in Figure 3.

When a liquid is added to cooled food grains in a rotating vessel as relatively large drops or as a continuous stream, a plurality of food grains adhere to one another with the interposition of a frozen liquid layer to form a cluster-like agglomerate of iced confection grains. More particularly, this phenomenon occurs when the liquid is introduced into the vessel by pouring by the use of a ladle or spoon, showering from a nozzle having relatively large openings or continuous running from a large diameter nozzle. In this case, the liquid arrives at the surfaces of the individual food grains in the liquid state, without freezing in a cold atmosphere in the vicinity of the cold food grains, and begins to freeze on the grain surfaces. Since the food grains are rotating and revolving, each grain comes into contact with some of the other grains while freezing of the liquid on the grain surfaces is proceeding. Then, the liquid existing between two contacted food grains completely freezes by the coldness of those food grains and serves to firmly agglomerate the contacted food grains. Figure 4 shows cluster-like agglomerates 16 made up of a plurality of generally globular grains 10 of an iced confection, according to the invention, and a frozen liquid layer 18 bonding the unit grains 10. Figure 5 shows agglomerates 20 of several jagged grains 22, which have peaked protuberances similarly to the grains of Figure 2, bonded by a frozen liquid layer 24.

Thus, the method according to the invention enables a granular iced confection to be produced in various grain shapes by adjusting the above described process conditions. Since the cooling temperature, rate of rotation and revolution of food grains and the size of liquid drops are variable, depending on other factors such as the cooling method, freezing temperature of the employed liquid, liquid temperature at the time of addition, feed rate of liquid and the size of food grains, the adjustment of the grain-shape determining conditions should be made appropriately with observation of the state of the food grains undergoing the icing.

Also it is possible to produce iced confection grains whose iced coating layer has a multi-layered structure like a china marble by varying the colour and/or flavour of the employed liquid in the course of adding the liquid to food grains. Besides, it is possible to enhance the cooling efficiency and shorten the operation time by freezing a portion of the liquid in advance such that the liquid is added to food grains in a state containing fine ice particles. Also, the heat resistance of a granular iced confection, according to the invention, can be enhanced to a certain extent by using water or liquid food, having a small depression of freezing point with respect to water, to form an outermost part of the iced coating layer so that the inner part formed by freezing of a liquid food, having a comparatively larger depression of freezing point with respect to water, is completely covered with the stronger outermost layer.

The invention will be illustrated by the following examples.

EXAMPLE 1

In this example (and also in the following Examples 2 and 3), ice was used as the core material for a granular iced confection according to the invention.

Using an ice shaver, a block of ice was broken into about 5 mm. grains. The ice grains were put into a revolving pan together with small blocks of dry ice, and the pan was immediately rotated. While continuing the rotation, a coloured and flavoured syrup was sprayed into the pan. As the pan containing the food grains and dry ice was being continuously rotated, the sprayed syrup spread over and froze to the surfaces of the ice grains. The spraying of the syrup was repeated several times at short intervals to allow freezing. A granular iced confection consisting of globular grains, as shown in Figure 1, of approximately 10-13 mm. in diameter, each formed of a granular core of ice and a relatively thick coating layer of frozen syrup, resulted.

By performing four runs of the above described process respectively using four differently coloured and flavoured syrups, that is, red-coloured and strawberry-flavoured syrup, blue-coloured and peppermint-flavoured syrup, yellow-coloured and pineapple-flavoured syrup and orange-coloured and orange-flavoured syrup, four batches of globular iced confections similar in shape and size but different in colour and flavour were produced. These four batches were mixed together and packed in small bags such that every bag contained the ice balls of all colours. Then, each bag of ice balls became a colourful and very pleasing article of commerce which allowed each consumer to enjoy either an iced confection of a favourite flavour by picking out a correspondingly coloured ice ball or two or more kinds of different flavours by alternately taking differently coloured ice balls.

EXAMPLE 2

The ice grains prepared at the start of Example 1 were put into a revolving pan together with small blocks of dry ice and the pan was rotated vigorously. In this state, liquid nitrogen was introduced into the pan to sufficiently cool the ice grains and the interior

of the pan. Then a coloured and flavoured syrup was repeatedly sprayed into the pan similarly to the spraying procedure in Example 1, maintaining the sufficiently cooled state. A granular iced confection consisting of irregularly shaped grains, each of which was 10-15 mm. in size and had roundish protuberances as shown in Figure 2, resulted. The core of each grain was an ice grain and the coating layer was of frozen syrup. Similarly to Example 1, four batches of granular iced confections fundamentally similar but different in colour and flavour were produced by using red-coloured, blue-coloured, yellow-coloured, and orange-coloured syrups mentioned in Example 1. A mixture of these four batches became a colourful granular iced confection product.

EXAMPLE 3

The ice grains mentioned in Example 1 were put into a revolving pan together with small blocks of dry ice. While continuously rotating the pan at an extremely low speed, liquid nitrogen was introduced into the pan to sufficiently cool the ice grains and the interior of the pan. Then a coloured syrup was sprayed into the pan similarly to Examples 1 and 2, maintaining the sufficiently cooled state, so that the ice grains were each covered with a frozen syrup layer. A granular iced confection consisting of very jagged grains each of which was 12 - 17 mm. in size and having many peaked and spiky protuberances as illustrated in Figure 3 resulted. Similarly to Example 1, four differently coloured and flavoured batches were produced to obtain a colourfully mixed granular iced confection product.

EXAMPLE 4

The red-, blue-, yellow- and orange-coloured globular grains of iced confection produced in Example 1 were mixed together. This mixture was put into a revolving pan together with a large number of small dry ice blocks, and the pan was rotated to cool the mixed grains sufficiently. Continuing the rotating operation and maintaining the sufficiently cooled state, a colourless sugar solution was gently poured into the pan by using a small ladle. The pouring of the sugar solution was repeated several times at relatively long intervals. As the result, a plurality of the globular grains agglomerated and were firmly bonded together by frozen sugar solution to form generally globular cluster-like agglomerates as illustrated in Figure 4. Each of these agglomerates comprises differently coloured grains of iced confection and a semi-transparent bonding layer of frozen sugar solution and accordingly had a beautiful external appearance. The thus agglomerated iced confection was very delicious and released the tastes of strawberry, peppermint, pineapple and orange as the agglomerate gradually melted in the mouth.

EXAMPLE 5

The differently coloured four batches of jagged grains (as shown in Figure 3) produced in Example 3 were mixed together. This mixture was put into a revolving pan together with liquid nitrogen. While the pan was rotated, additional liquid nitrogen was dropped into the pan in order to promote sufficient cooling. Thereafter a colourless sugar solution was showered into the pan from a nozzle having a number of small openings, continuing the rotation operation and maintaining the sufficiently cooled state. As the result, a plurality of the jagged grains were bonded together by a semi-transparent layer of frozen sugar solution to form cluster-like agglomerates of novel shapes as shown in Figure 5.

EXAMPLE 6

Flesh of apple was cut into granular pieces about 3 mm. in size. The apple pieces were cooled in a rotary vessel which also contained small blocks of dry ice. Then, continuing rotation of the vessel, red-coloured apple juice was sprayed into the vessel to cover each of the apple flesh pieces with a layer of frozen apple juice. The thickness of the frozen juice layer was about 2 mm. Next, lightly yellow-coloured vermont (cider vinegar sweetened with honey) was sprayed into the rotating vessel to form a frozen vermont layer on the entire surface of the frozen apple juice layer of each grain, and finally water was sprayed into the rotating vessel to form an outermost layer of ice on each grain. A granular iced confection consisting of globular grains about 13 mm. in diameter resulted. Each grain of this iced confection had a core of apple flesh which was entirely covered with a red-coloured layer of frozen apple juice, a yellow-coloured intermediate layer of frozen vermont and a semi-transparent outermost layer of ice. Looking from the outside, it was appreciated that the colour of the frozen layers gradually varied from the innermost red to the outer yellow via intermediate orange zone, so that this granular iced confection delighted the eye. Moreover, this iced confection was very delicious because the taste of vermont well harmonized with the taste of apple when each grain was bitten.

EXAMPLE 7

A compressed tablet having the taste of a refreshing beverage was moulded into globular grains about 7 mm. in diameter to be used as a granular food in the present invention. The grains were put into a box-shaped vessel approximately 100 x 100 cm. in plan and approximately 25 cm. deep together with a large number of small blocks of dry ice. This vessel was subjected to an eccentrically rotational movement so that the sweet grains were rotated and revolved in the vessel and cooled by the dry ice blocks. Continuing the rotational operation, a flavoured sugar syrup was sprayed into the vessel so that very fine particles of the syrup adhered and froze to the surfaces of the sweet grains. Still continuing the rotational operation, the spraying of the syrup was repeated several times at appropriate intervals to form a sufficiently thick layer of frozen syrup on the entire surface of each grain. Finally water was once sprayed into the rotating vessel to form an outermost ice layer on the frozen syrup layer. A granular iced confection consisting of globular grains each having a smooth surface and a diameter of about 25 mm. resulted. This iced confection had a very good taste and gave a uniquely mixed feeling and taste due to the iced layer and the flavoured sweet used as the core material.

EXAMPLE 8

A box-shaped vessel similar in shape and size to the vessel used in Example 7 was provided with a

cooling pipe through which a refrigerant was circulated. Marshmallow grains about 10 mm. in size were put into this vessel, and, circulating the refrigerant, the vessel was subjected to a seesaw-like generally vertically vibrational movement and at the same time liquid nitrogen was introduced into the vessel to cool the moving marshmallow grains sufficiently. Then a syrup containing an organic acid and lemon essence was intermittently injected into the vessel from a nozzle having very small openings, so that the syrup arrived at the surfaces of the marshmallow grains as tiny droplets and froze to the grain surfaces. The product of this example was a granular iced confection consisting of about 25 - 30 mm. grains each having an irregular shape with short and roundish protuberances.

EXAMPLE 9

Flesh of banana was cut into granular pieces of about 10 mm. The banana pieces were immersed in an ascorbic acid solution and withdrawn therefrom and then rapidly frozen at −30 to −50°C. The thus prepared granular food was put into a dish-shaped vessel mounted on an inclined and revolving shaft together with small blocks of dry ice. The vessel was slowly rotated, and ascorbic acid solution added with sugar was sprayed into the rotating vessel. Produced by this process was a granular iced confection consisting of generally globular grains each having a core of frozen banana grain and a coating layer of sweetened and frozen ascorbic acid solution.

The above process was repeated except that the ascorbic acid solution was introduced into the rotating vessel in the form of continuous drops. As a result, a plurality of generally globular grains of iced confection were bound into an agglomerate by a frozen layer of the ascorbic acid solution.

EXAMPLE 10

Raisins were put into a papyrus, boat-shaped vessel 150 cm. long and 50 cm. wide having a nearly flat bottom together with small blocks of dry ice, and the vessel was subjected to an eccentric movement in a horizontal plane. After cooling of the raisins, a syrup containing wine and vanilla essence was sprayed into the moving vessel to cause the syrup to freeze to the raisins. This process gave a roughly globular iced confection.

When this process was modified by using liquid nitrogen in addition to dry ice, the grains of the resultant iced confection had irregular shapes with short and rounded protuberances. When this process was further modified by pouring the syrup into the vessel with a small ladle, the product consisted of cluster-like agglomerates each formed of several rains bound together by a layer of frozen syrup.

EXAMPLE 11

Flesh of apple and flesh of pineapple both removed from rind and core were cut into granular pieces of 10 - 15 mm. and mixed together. This mixture was put in a bos-shaped vessel together with small blocks of dry ice, and the box was subjected to generally vertically vibrational movement to cool the contents. Then apple juice was sprayed into the vessel.

The product of this process was a globular iced confection consisting of grains containing either frozen apple or frozen pineapple coated with a layer of frozen apple juice.

When this process was repeated except that the apple juice was introduced into the vessel by injection from a nozzle having many openings, the product was agglomerates each formed of a considerable number of frozen and iced apple and pineapple grains bound together by a layer of frozen syrup.

EXAMPLE 12

Red beans boiled and dipped in a syrup were put into a circular and dish-shaped vessel mounted on an inclined shaft together with small blocks of dry ice. The vessel was rotated with simultaneous upward and downward oscillatory movement of the shaft. After sufficient cooling of the bean, a syrup added with brandy and vanilla essence was sprayed into the vessel. The product of this process was a granular iced confection consisting of roughly globular grains each formed of a red bean and a coating layer of frozen syrup.

When this process was modified by introducing liquid nitrogen into the vessel in addition to dry ice, the resultant iced confection consisted of grains each containing a red bean and an irregularly shaped layer of frozen syrup with short and roundish protuberances.

When the second process was repeated except that the vessel was rotated at a lower rate, each grain of the resultant iced confection was very jagged and had peaked protuberances.

When the syrup was introduced into the vessel by continuously discharging downwardly from a nozzle of a large opening, the obtained product was agglomerates each formed of some red beans bound by a layer of frozen syrup.

EXAMPLE 13

Globular candy drops 8 mm. in diameter were put into a revolving pan together with small blocks of dry ice, and the pan was rotated to cool the candy drops. Then sweetened coffee in liquid state was intermittently sprayed into the revolving pan to coat the entire surface of the candy drops with frozen coffee. By admixing fine snowflake-like particles of already frozen coffee with the coffee liquid, thereby promoting the growth of the frozen coffee layer on each candy drop, an iced confection consisting of globular grains each having a thick layer of frozen coffee and similar in size to a table tennis ball was obtained.

EXAMPLE 14

Mashed potao seasoned with salt was formed into globular grains of about 5 mm. in diameter and frozen in a refrigerator. The thus prepared granular food was put into a revolving pan which had been cooled by liquid nitrogen, and the pan was rotated with continued cooling by liquid nitrogen. Then a clear soup was intermittently sprayed into the pan in small quantities so as to allow the soup to cover and freeze to each grain of the frozen mashed potato. A novel type of iced confection produced by this process consisted of globular grains.

CLAIMS

1. A granular iced confection, each grain of the iced confection comprising a granular food which serves as a core and a coating layer of a frozen liquid

frozen to said granular food so as to cover said granular food entirely.

2. An iced confection according to Claim 1, wherein said coating layer has a generally smooth and round outer surface.

3. An iced confection according to Claim 1 or 2, wherein said each grain has a generally globular shape.

4. An iced confection according to Claim 1, wherein said coating layer has an uneven outer surface.

5. An iced confection according to Claim 1, wherein said coating layer has protuberances on said outer surface.

6. An iced confection according to any one of Claims 1 to 5, wherein said coating layer has a multi-layered structure.

7. An iced confection according to Claim 6, wherein said coating layer has at least two layers different in colour.

8. An iced confection according to Claim 6, wherein said coating layer has an outermost layer which has a higher melting temperature than any other part of said multi-layered structure.

9. An iced confection according to Claim 1, wherein a plurality of grains of the iced confection are bonded by a layer of frozen liquid to form a cluster-like agglomerate.

10. An iced confection according to Claim 9, wherein said plurality of grains are substantially similar in construction and shape.

11. An iced confection according to Claim 10, wherein said plurality of grains are all generally globular.

12. An iced confection according to Claims 9, 10 or 11, wherein said plurality of grains comprise at least two differently coloured grains.

13. An iced confection according to Claim 9, wherein said plurality of grains comprise at least two kinds of grains different in construction or shape or both.

14. An iced confection according to Claim 9, wherein said coating layer of each of said plurality of grains has an uneven outer surface.

15. An iced confection according to Claim 9, wherein said coating layer of each of said plurality of grains has protuberances on the outer surface thereof.

16. An iced confection according to Claim 1 to 9, wherein said granular food is an inherently granular food.

17. An iced confection according to Claim 1 to 9, wherein said granular food is a cut piece of a natural food.

18. An iced confection according to Claim 1 to 9, wherein said granular food is a frozen liquid.

19. An iced confection according to Claim 1 to 9, wherein said granular food is a piece of a soft and resilient food.

20. An iced confection according to Claim 1 or 9, wherein said granular food is a compressed tablet.

21. An iced confection according to Claim 1 or 9, wherein said coating layer is formed of a coloured frozen liquid.

22. An iced confection according to Claim 1 or 9, wherein said coating layer is semi-transparent.

23. A method of producing a granular iced confection, comprising the steps of: (a) rotating and revolving grains of a granular food and simultaneously cooling said grains; (b) adding a liquid to the rotating and revolving grains when said grains are cooled below the freezing temperature of said liquid, and (c) continuing to rotate and revolve said grains after the addition of said liquid, thereby causing the added liquid to cover and freeze to each of said grains.

24. A method according to Claim 23, wherein said grains are rotated and revolved by putting said grains in a vessel and subjecting said vessel to at least one of a rotational movement, an eccentrically rotational movement and a vibrational movement.

25. A method according to Claim 23, wherein said grains are rotated and revolved by keeping said grains in a vessel and continuously blowing an air or gas on to said grains so as to maintain said grains in a state of fluidized bed.

26. A method according to Claim 24 or 25, wherein said grains are cooled by cooling said vessel from the outside.

27. A method according to Claim 24 or 25, wherein said grains are cooled by introducing a cold air or gas into said vessel.

28. A method according to Claim 24, wherein said grains are cooled by keeping at least one of the following:– dry ice, liquid nitrogen and liquid carbon dioxide, in said vessel.

29. A method according to Claim 24, wherein said liquid is added to said grains by spraying said liquid into said vessel.

30. A method according to Claim 24, wherein said liquid is added to said grains by introducing said liquid into said vessel in the form of drops.

31. A method according to Claim 24, wherein said liquid is added to said grains by showering said liquid into said vessel.

32. A method according to Claim 24, wherein said liquid is added to said grains by introducing said liquid into said vessel in the form of continuous stream.

33. A method according to Claim 24, wherein said liquid is added to said grains by introducing said liquid into said vessel intermittently at time intervals sufficient to allow the precedingly introduced liquid to freeze.

34. A method according to Claim 23, further comprising the step of adding a liquid to said grains after freezing of the liquid already added and continuing to rotate and revolve said grains in a cooled state such that the subsequently added liquid covers and freezes to the precedingly added and frozen liquid.

35. A method according to Claim 23, further comprising the steps of (d) rotating and revolving grains of a granular iced confection obtained through said steps (a), (b) and (c) and simultaneously cooling said grains of said iced confection, and (e) adding a liquid to the cooled and rotating and revolving grains of said iced confection, such that a plurality of grains of said iced confection are bound to form a cluster-like agglomerate by a layer of the

subsequently added and frozen liquid.

36. A method according to Claim 23, wherein said liquid contains frozen particles of said liquid.

37. A method according to Claim 23, wherein said liquid is added to said grains after said grains are cooled to a temperature at least 5°C below the freezing temperature of said liquid.

38. A granular iced confection produced substantially as described herein with reference to the accompanying drawings and as described in any of the described examples.

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